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Congenital Cardiology Solutions

INTRAUTERINE EXPOSURE TO MATERNAL DIABETES IS ASSOCIATED WITH INCREASED AORTIC STIFFNESS IN EARLY AND LATE INFANCY

Poster Contributions
Poster Sessions, Expo North
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Session Title: Congenital Cardiology Solutions: Aortic Disease
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Background: Infants of mothers with diabetes (IDM), the most common complication of pregnancy, have an increased risk of adult cardiovascular disease (CVD) later in life. IDMs have been shown to have increased aortic intimal-medial thickness in the neonatal period which may contribute to or be a precursor of CVD. Experimental models also suggest the intrauterine diabetic environment structurally and functionally alter the aorta of affected offspring.We sought to determine if there is evidence of increased aortic stiffness, a feature of CVD in adults with diabetes, in IDM in infancy.

Methods: Diabetic pregnancies were recruited prospectively to examine the role of diabetes in fetal cardiovascular programming. For this aspect of the study, their infants were evaluated at 3-6 weeks (early infancy) and at 6-12 months (late infancy) by echocardiography for assessment of aortic stiffness and the findings were compared to those of healthy infants from uncomplicated pregnancies. Pulse wave velocity (PWV) was calculated as {D/(T2-T1)}; where D was the distance of blood flow through the arch; T1 the time measured from QRS to onset of ascending and T2, the onset of descending aortic systolic flow.

Results: Thirty three maternal-infant pairs were assessed including 13 IDMs and 20 controls.Five IDMs had assessments both in early and later infancy . No statistical difference was observed in age at exam, BSA and systolic blood pressure between IDMs and controls. Hemoglobin A1C (HbA1) of the diabetic mothers during pregnancy ranged from 5.7 to 9.6 (median 7.4±1.1). Aortic PWV were significantly higher among IDMs compared to control (mean 5.7±2.25 M/s vs 3.7 ± 1.2M/s respectively, p=0.008). Interestingly, data for the paired IDM group showed that PWV only increased in late DM (7.2 ±1.1) compared with early DM (5.8 ±1.8) (p=0.04) In addition, IDM PWV in this small cohort tended to correlate positively with maternal HbA1C (r=0.56, p=0.04).

Conclusion: IDM have evidence of increased aortic stiffness in early infancy, which may increase later in infancy and may relate to maternal glycemic control.The pathogenic mechanisms responsible for increased aortic stiffness and its relevance to adult CVD requires further investigation.